

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "another passage in the liner" (claim 27) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 6, 9-14, 21, and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (US Patent 4,934,836) in view of Moritan (US Patent 5,715,116).

Tanaka discloses a fluid dynamic bearing motor comprising:

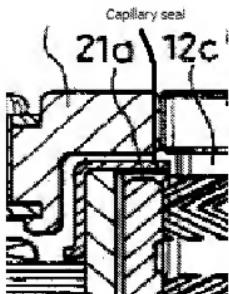
A base (12) defining a bore
a stationary liner (13) having a longitudinal wall (13a) and further having a bottom (13b) that is contiguous from the wall extending radially inward from the wall, the bottom defining a passage (17) through the stationary liner,
a rotor assembly (60, 61) having a shaft (30) that is rotatably supported within the liner,
a fluid dynamic bearing (15) disposed between the shaft and the longitudinal wall.

Tanaka does not disclose a capillary seal between the shaft and the liner having a close mating relationship end in fluid communication with the fluid dynamic bearing and an opposing diverging mating relationship end defining an inlet reservoir; and

a channel outside the liner, extending along the bottom and the longitudinal wall, that operably fluidly communicates recirculating fluid from the fluid dynamic bearing via the passage to the inlet reservoir.

Tanaka does however disclose a channel outside the liner (20+21) that extends along the bottom (20) of the liner.

Moritan teaches a fluid dynamic bearing motor with a a capillary seal between the shaft and the liner having a close mating relationship end in fluid communication with the fluid dynamic bearing and an opposing diverging mating relationship end defining an inlet reservoir (fig. 1c, see below)



And a channel (23b) outside the liner (21), extending along the bottom and the longitudinal wall (the channel begins at reference 21' and proceeds along the bottom of

the liner and the longitudinal wall), for the purpose of permitting smooth assembly of the motor (col. 8, lines 50-51).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tanaka to include the capillary seal and channel as taught by Moritan for the desired purpose of permitting smooth assembly of the motor. Moritan teaches the passage of lubricant through the channel, and thus the channel functions as a recirculation channel.

Regarding claim 6, the fluid dynamic bearing comprises a journal bearing (15) operably supporting the shaft in rotation against the wall and a thrust bearing (16) operably supporting the shaft in rotation against the bottom.

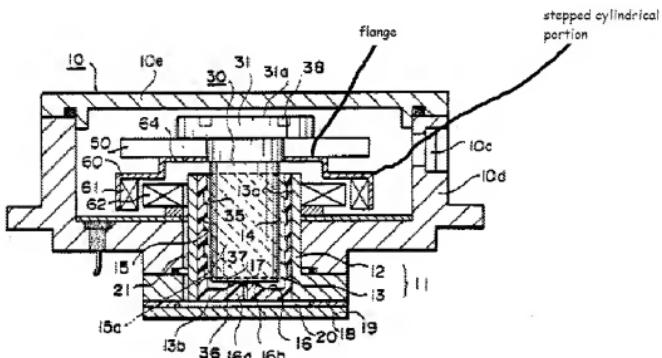
Regarding claims 9 and 10, the base is disclosed as aluminum, which is capable of being manufactured by machining, forging and casting.

[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

MPEP 2113.

Regarding claims 11 and 12, the rotor assembly includes a hub (60). The process by which the hub of the rotor assembly is made does not impart any additional structure to the device. See MPEP 2113.

Regarding claim 13, the hub further includes a flange and a stepped cylindrical sidewall extending from the flange and circumscribing at least a portion of the base (see figure below).



Regarding claim 14, a magnet (61) is attached to the hub and a stator (62) is coupled to the base, the magnet and stator are configured to generate a preloading force on the hub (a magnetic force is generated between the magnet and stator, accordingly the hub is preloaded).

Regarding claim 21, the liner defines an open end and the recirculation channel fluidly connects the fluid dynamic bearing via the hole with the open end.

Regarding claim 26, the channel of Moritan guides recirculating fluid around a distal end of the longitudinal wall to enter the inlet reservoir.

Regarding claim 27, the channel of Moritan guides recirculating fluid through another passage (21a) in the liner (passage 21a is another passage in the liner in as much as applicant's figures disclose another passage "in the liner") to enter the inlet reservoir.

Claims 7 and 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka as applied to claim 6 above, further in view of Tanaka et al (US 2001/0022869, herein referenced as Tanaka '869 to avoid confusion).

Tanaka does not disclose the shaft comprising a patterned feature that pumps fluid in the fluid dynamic bearing toward the hole, however Tanaka does disclose a patterned feature on the liner which pumps fluid toward the hole.

Tanaka '869 teaches the patterned feature may be applied to the liner (17, see fig. 1) or to the shaft (117, see fig. 3) to achieve the same result, preventing lubricant from escaping the bearing (see, for example, paragraph 0058).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tanaka and form a patterned feature on the shaft for the desired purpose of providing a means of asymmetrically pumping fluid to prevent lubricant from flowing out of the bearing as taught by Tanaka '869.

Regarding claim 8, Tanaka discloses the patterned feature including at least two grooved bearing surfaces (the radial surface and the thrust surface). Tanaka '869 also discloses at least two grooved bearing surfaces (107).

Response to Arguments

Applicant's arguments with respect to claims 1, 6-14, 21 and 26-27 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUSTIN KRAUSE whose telephone number is (571)272-3012. The examiner can normally be reached on Monday - Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Justin Krause/
Examiner, Art Unit 3656

/Thomas R. Hannon/
Primary Examiner, Art Unit 3656